

Statistics in focus

ECONOMY AND FINANCE

THEME 2 – 11/2000

PRICES AND PURCHASING POWER PARITIES

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PURCHASING POWER PARITIES AND RELATED ECONOMIC INDICATORS FOR THE EUROPEAN UNION AND FOUR OTHER COUNTRIES

- PRELIMINARY RESULTS FOR 1998 -

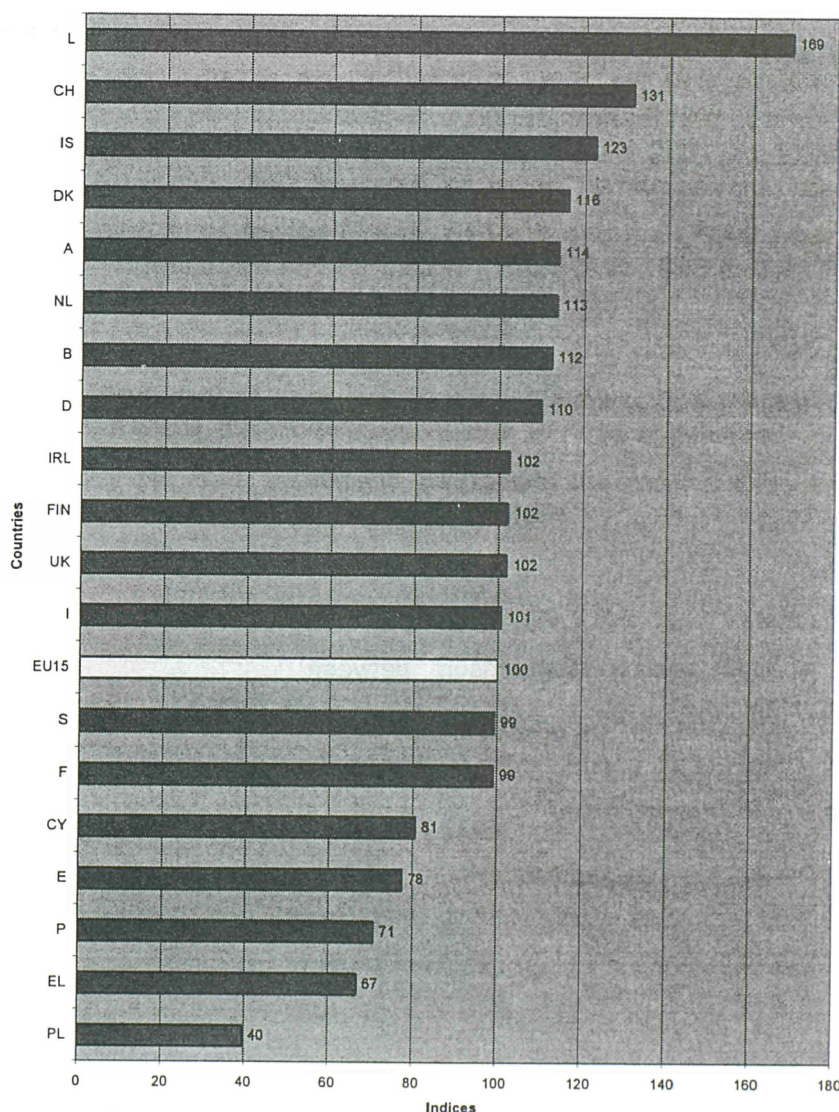
Ian DENNIS

1. Overview

Chart 1 ranks the participant countries in terms of their per capita GDP expenditure volumes in real terms – calculated using the 1998 preliminary estimates of PPPs.

Chart 1

1998 RANKING OF COUNTRIES BY PER CAPITA VOLUME INDEX
AT THE LEVEL OF TOTAL GDP



Strictly speaking these volume indices do not establish a precise ranking of countries; in fact they only give an indication of the *comparative order of magnitude* (in volume terms) of economic activity in each country in relation to others. Thus, when comparing per capita volume indices for Italy and UK (101 and 102 respectively), the conclusion which should be drawn is that per capita GDP in volume terms in these two countries is of the *same order of magnitude*. Note that a similar comparison of the per capita value indices for these two countries computed using exchange rates (91 and 105 respectively) gives a biased view, due to the difference in price levels.

Market exchange rates are commonly used for international comparisons of economic aggregates expressed in nominal values. However, they do not allow a real comparison of the volume of goods and services produced and used in different countries because exchange rates quite often reflect other elements than price level differences alone.

The calculation of *purchasing power parities* (PPPs) makes it possible to eliminate the combined impact of price level differences and other elements from the comparison and thus obtain a real volume comparison between countries of, for example, Gross Domestic Product (GDP) per capita, one of the main indicators of economic activity.

The results for 1998 which are presented in this publication clearly demonstrate this feature. In general, the use of market exchange rates overestimates the real volume of GDP of countries where price levels are high, and vice versa. Use of PPPs for the conversion of national figures reveals striking differences between nominal values and real volumes, such as Denmark (-21%), Portugal (+48%) and Poland (+122%). However, this does not alter the fact that differences in per capita volumes of goods and services consumed can be significant. For example, the per capita GDP of Greece is only 40% of Luxembourg, or 61% of Germany, when measured in PPP-based real volumes.

2. Cross rates

Table 1 presents the 1998 preliminary estimates of PPPs in a more user-friendly form. The table should be read horizontally. It allows the reader to identify the appropriate rate of conversion to apply in order to express GDP expenditure values stated in other currencies into common price level terms in another currency, and thereby enable comparison of the real volume of goods and services purchased.

For example, the line for Belgium shows that 100 BEF will purchase an equivalent volume of goods and services as 24.1 DKK. Conversely, the line for Denmark shows that 10 DKK will purchase an equivalent volume of goods and services as 41.6 BEF (the slight difference between these two sets of parities is due to rounding).

3. Commentary on the results

Columns 2 and 3 of Table 2 show the exchange rates and the purchasing power parities for the different countries. The ratio between the PPP and the exchange rate is an indicator of the relative price level in each country. For comparison purposes, this ratio is shown in relation to the EU-15 average in Column 4. If the figure is higher than 100, the country concerned is relatively expensive as compared to the EU-15 average, and the use of market exchange rates over-estimates the volumes; the opposite is true if the price level index is lower than 100.

Column 4 reveals differences between the various price levels of 68 to 127 for EU countries and of 46 to 131 for all countries. This clearly demonstrates the importance of using PPPs instead of market exchange rates for comparing the economies of different countries.

Other significant indicators for international comparisons are the per capita GDP indices in Columns 7 and 8 which represent the relation between the per capita GDP of each country and the average per capita GDP of the EU-15 countries. It is worth noting that the index can be significantly different according to whether market exchange rates (Column 7) or PPPs (Column 8) are used.

Thus, Denmark, for which the per capita value index is 147 if the calculation is based on data in ECU, changes to a volume index of 116 if the conversion factor is PPP. This is related to its high price level index (127).

The opposite phenomenon can be observed for Greece and Portugal for which per capita value indices of 52 and 48 respectively change to per capita volume indices of 67 and 71, related to their low price level indices of 77 and 68. The ratio of per capita GDP between Portugal and Switzerland is 1 to 3.5 for data in ECU but less than 1 to 2 if the conversion factor is PPP. This result again shows the need to have purchasing power parities as a tool to obtain real volume comparisons between countries.

1998 is a transition year in terms of the switch from the ESA'79 classification to the ESA'95 classification for both GDP expenditure values and for the calculation of PPPs. These preliminary results have been calculated in accordance with the ESA'79 classification.

Ten countries supplied Eurostat with GDP figures for 1998 in accordance with the ESA'95 classification, and for these countries the expenditure values at the necessary level of detail were calculated by Eurostat using the aggregates supplied for 1998 and the detailed structure from 1997 in ESA'79 format.

TABLE 1

CROSS RATES

PURCHASING POWER PARITIES

| | B | DK | D | EL | E | F | IRL | I | L | NL | A | P | FIN | S | UK | EU-15 | IS | CH | PL | CY |
|-------|------|------|-------|-----|------|------|-------|------|------|-------|------|------|------|------|-------|-------|------|-------|-------|-------|
| B | 100 | 24,1 | 5,32 | 646 | 344 | 18 | 1,93 | 4430 | 110 | 5,35 | 36,2 | 346 | 16,3 | 26,7 | 1,76 | 2,53 | 222 | 5,17 | 4,55 | 1,11 |
| DK | 41,6 | 10 | 2,21 | 268 | 143 | 7,48 | 0,8 | 1841 | 45,9 | 2,22 | 15,1 | 144 | 6,77 | 11,1 | 0,732 | 1,05 | 92,3 | 2,15 | 1,89 | 0,46 |
| D | 18,8 | 4,52 | 1 | 121 | 64,6 | 3,38 | 0,362 | 832 | 20,7 | 1,01 | 6,81 | 65,1 | 3,06 | 5,02 | 0,331 | 0,475 | 41,7 | 0,972 | 0,855 | 0,208 |
| EL | 15,5 | 3,73 | 0,825 | 100 | 53,3 | 2,79 | 0,298 | 686 | 17,1 | 0,829 | 5,61 | 53,6 | 2,53 | 4,14 | 0,273 | 0,392 | 34,4 | 0,802 | 0,705 | 0,171 |
| E | 29,1 | 7 | 1,55 | 188 | 100 | 5,23 | 0,56 | 1288 | 32,1 | 1,56 | 10,5 | 101 | 4,74 | 7,77 | 0,512 | 0,736 | 64,6 | 1,5 | 1,32 | 0,322 |
| F | 55,6 | 13,4 | 2,96 | 359 | 191 | 10 | 1,07 | 2462 | 61,3 | 2,97 | 20,1 | 192 | 9,06 | 14,9 | 0,979 | 1,41 | 123 | 2,88 | 2,53 | 0,615 |
| IRL | 51,9 | 12,5 | 2,76 | 335 | 179 | 9,35 | 1 | 2301 | 57,3 | 2,78 | 18,8 | 180 | 8,47 | 13,9 | 0,915 | 1,31 | 115 | 2,69 | 2,36 | 0,575 |
| I | 22,6 | 5,43 | 1,2 | 146 | 77,6 | 4,06 | 0,435 | 1000 | 24,9 | 1,21 | 8,18 | 78,2 | 3,68 | 6,03 | 0,398 | 0,571 | 50,2 | 1,17 | 1,03 | 0,25 |
| L | 90,6 | 21,8 | 4,82 | 585 | 312 | 16,3 | 1,74 | 4014 | 100 | 4,85 | 32,8 | 314 | 14,8 | 24,2 | 1,6 | 2,29 | 201 | 4,69 | 4,12 | 1 |
| NL | 18,7 | 4,5 | 0,995 | 121 | 64,3 | 3,36 | 0,36 | 828 | 20,6 | 1 | 6,77 | 64,7 | 3,05 | 4,99 | 0,329 | 0,473 | 41,5 | 0,967 | 0,85 | 0,207 |
| A | 27,6 | 6,64 | 1,47 | 178 | 94,9 | 4,97 | 0,531 | 1223 | 30,5 | 1,48 | 10 | 95,6 | 4,5 | 7,37 | 0,486 | 0,698 | 61,3 | 1,43 | 1,26 | 0,306 |
| P | 28,9 | 6,95 | 1,54 | 186 | 99,3 | 5,2 | 0,556 | 1279 | 31,9 | 1,54 | 10,5 | 100 | 4,71 | 7,72 | 0,509 | 0,731 | 64,2 | 1,49 | 1,31 | 0,32 |
| FIN | 61,3 | 14,8 | 3,27 | 396 | 211 | 11 | 1,18 | 2717 | 67,7 | 3,28 | 22,2 | 212 | 10 | 16,4 | 1,08 | 1,55 | 136 | 3,17 | 2,79 | 0,679 |
| S | 37,4 | 9 | 1,99 | 242 | 129 | 6,73 | 0,721 | 1658 | 41,3 | 2 | 13,6 | 130 | 6,1 | 10 | 0,659 | 0,947 | 83,2 | 1,94 | 1,7 | 0,414 |
| UK | 56,8 | 13,7 | 3,02 | 367 | 195 | 10,2 | 1,09 | 2515 | 62,7 | 3,04 | 20,6 | 197 | 9,26 | 15,2 | 1 | 1,44 | 126 | 2,94 | 2,58 | 0,629 |
| EU-15 | 39,5 | 9,51 | 2,1 | 255 | 136 | 7,11 | 0,761 | 1751 | 43,6 | 2,11 | 14,3 | 137 | 6,44 | 10,6 | 0,696 | 1 | 87,8 | 2,05 | 1,8 | 0,438 |
| IS | 45 | 10,8 | 2,4 | 291 | 155 | 8,1 | 0,866 | 1994 | 49,7 | 2,41 | 16,3 | 156 | 7,34 | 12 | 0,793 | 1,14 | 100 | 2,33 | 2,05 | 0,498 |
| CH | 19,3 | 4,65 | 1,03 | 125 | 66,4 | 3,48 | 0,372 | 856 | 21,3 | 1,03 | 7 | 66,9 | 3,15 | 5,16 | 0,34 | 0,489 | 42,9 | 1 | 0,879 | 0,214 |
| PL | 22 | 5,29 | 1,17 | 142 | 75,6 | 3,95 | 0,423 | 973 | 24,2 | 1,18 | 7,96 | 76,1 | 3,58 | 5,87 | 0,387 | 0,556 | 48,8 | 1,14 | 1 | 0,243 |
| CY | 90,3 | 21,7 | 4,81 | 583 | 311 | 16,3 | 1,74 | 4001 | 99,7 | 4,83 | 32,7 | 313 | 14,7 | 24,1 | 1,59 | 2,29 | 201 | 4,67 | 4,11 | 1 |

**TABLE 2 - Purchasing power parities and related economic indicators
for the European Union and four other countries
- Preliminary results for 1998**

| 1 | 2 <u>Exchange</u> <u>rate</u> | 3 <u>Parity</u> | 4 <u>Price level</u> <u>index</u> | 5 <u>Total GDP</u> <u>in nat. curr.</u> | 6 <u>Population</u> | 7 <u>Per capita</u> <u>GDP value</u> | 8 <u>Per capita</u> <u>GDP volume</u> |
|--------------|--|---------------------------|--|--|-------------------------------|---|--|
| B | 40.62 | 39.52 | 97 | 9,022.0 | 10,197 | 109 | 112 |
| DK | 7.50 | 9.51 | 127 | 1,166.6 | 5,303 | 147 | 116 |
| D | 1.969 | 2.104 | 107 | 3,784.2 | 82,029 | 118 | 110 |
| EL | 330.7 | 255.2 | 77 | 35,677 | 10,511 | 52 | 67 |
| E | 167.2 | 135.9 | 81 | 82,650 | 39,371 | 63 | 78 |
| F | 6.601 | 7.112 | 108 | 8,485.7 | 60,405 | 107 | 99 |
| IRL | 0.7862 | 0.7610 | 97 | 57.512 | 3,705 | 99 | 102 |
| I | 1944 | 1751 | 90 | 2,024,100 | 57,592 | 91 | 101 |
| L | 40.62 | 43.61 | 107 | 631.26 | 429 | 182 | 169 |
| NL | 2.220 | 2.115 | 95 | 750.35 | 15,700 | 108 | 113 |
| A | 13.85 | 14.32 | 103 | 2,622.6 | 8,078 | 118 | 114 |
| P | 201.7 | 136.9 | 68 | 19,246 | 9,968 | 48 | 71 |
| FIN | 5.983 | 6.443 | 108 | 676.14 | 5,153 | 110 | 102 |
| S | 8.92 | 10.56 | 118 | 1,849.7 | 8,851 | 118 | 99 |
| UK | 0.6764 | 0.6961 | 103 | 837.62 | 59,227 | 105 | 102 |
| EU-15 | 1 | 1 | 100 | 7,498.7 | 376,520 | 100 | 100 |
| IS | 79.70 | 87.83 | 110 | 586.57 | 274 | 135 | 123 |
| CH | 1.622 | 2.045 | 126 | 380.01 | 7,100 | 166 | 131 |
| CY | 0.5774 | 0.4376 | 76 | 4.6501 | 661 | 61 | 81 |
| PL | 3.918 | 1.798 | 46 | 549.47 | 38,700 | 18 | 40 |

Column 2 Average exchange rate for 1998 (1 ECU = ??? National currency units)

Column 3 Purchasing power parities (1 PPS = ??? National currency units)

Column 4 Price level index (EU15 = 100)

Column 5 Total GDP for 1998 in national currency (thousand millions)

Column 6 Average population for 1998 (thousands)

Column 7 GDP per capita value index, based on ECU values (EU15 = 100)

Column 8 GDP per capita volume index, based on PPS values (EU15 = 100)

N.B.

These preliminary results are based on the price data and the estimates of GDP nominal values in national currency and of population levels that were available to Eurostat in March 2000. These estimates will be revised and final results will be published later this year. The results presented here are subject to sampling and other errors; small differences between the measures are unlikely to be statistically significant

➤ ESSENTIAL INFORMATION - METHODOLOGICAL NOTES



PPPs are obtained using the price ratios between the different countries for a basket of goods and services which are both comparable and representative. The individual price ratios are aggregated, according to well defined criteria, up to the GDP global parity level.

Iceland, Norway and Switzerland participate in the Eurostat annual comparison programme as EFTA countries. Poland has been a full member since 1994. Cyprus joined the programme for the first time in 1997. Ten more countries have since joined the comparison programme: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Romania, Slovak Republic and Slovenia.

For these 1998 preliminary estimates, Eurostat, the Statistical Office of the European

Communities, has calculated purchasing power parities for the 15 Member States together with Iceland, Switzerland, Cyprus and Poland. The results for Norway are not yet available.

This note presents only the main results for per capita GDP. More detailed results will be published later in the year.

These results take into account the price data, estimates of GDP nominal expenditure values and estimates of population levels that were available in March 2000. Updated information will be used for the calculation of the final 1998 results, which may therefore show some substantial differences.

The results of a wider comparison including more countries will also be published later this year.

To know more about:

"Purchasing power parities and related economic indicators: detailed results for 1997" (published November 1999).

"Purchasing power parities and related economic indicators: detailed results for 1998" (in preparation)

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